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ABSTRACT

This environmental unit is one of a series designed for integration within the existing curriculum. The unit is self-contained, requiring little teacher preparation. The philosophy of the units is based on an experience-oriented process encouraging self-paced independent student work. In this unit, elementary school children explore the use of natural items for art projects. As they collect these items, the students have an opportunity to observe and experience their environment. The art activities include work with plant dyes, printings, collages, centerpieces, terrariums, sand casting, mobiles, sand and soil paintings, and dried plant arrangements. In many cases, there is an attempt to relate an art experience to a science experience. Included in the unit is a list of materials needed and directions for the 27 art projects. (MA)

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A Teacher's Preparation for

Nature's Part In Art

An Environmental [illegible]

Creating [illegible]

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THE ENVIRONMENTAL UNITS

This is one of a group of Environmental Units written by the Environmental Science Center and published by the National Wildlife Federation.

In both theory and practice education is the essential base for long-range local, regional and national programs to improve and maintain the quality of environment necessary for man's welfare and survival. Citizens must be aware of ecological relationships in order to recognize, appreciate and fulfill constructive roles in society. This awareness should be launched through the existing educational process--in classroom and related school activities. No special courses on ecology can replace the need to integrate ecological learning throughout the existing curricula of our school systems. Furthermore, the life-styles and value-systems necessary for rational environmental decisions can best be acquired through repeated exposure to ecological learning which pervades the total educational experience.

It was with these thoughts that we developed these curriculum materials. They were designed for the classroom teacher to use with a minimal amount of preparation. They are meant to be part of the existing curriculum—to complement and enhance what students are already experiencing. Each unit is complete in itself, containing easy-to-follow descriptions of objectives and methods, as well as lists of simple materials.

The underlying philosophy throughout these units is that learning about the environment is not a memorization process, but rather an experience-oriented, experiment-observation-conclusion sort of learning. We are confident that students at all levels will arrive at intelligent ecological conclusions if given the proper opportunities to do so, and if not forced into "right" answers and precisely "accurate" names for their observations. If followed in principle by the teacher, these units will result in meaningful environmental education.

In the process of development, these units have been used and tested by classroom teachers, after which they have undergone evaluations, revisions and adaptations. Further constructive comments from classroom teachers are encouraged in the hope that we may make even more improvements.

A list of units in this group appears on the inside back cover.

About the National Wildlife Federation—1412 Sixteenth Street, N.W., Washington, D.C. 20036

Founded in 1936, the National Wildlife Federation has the largest membership of any conservation organization in the world and has affiliated groups in each of the 50 states, Guam, and the Virgin Islands. It is a non-profit, non-governmental organization devoted to the improvement of the environment and proper use of all natural resources. NWF distributes almost one million copies of free and inexpensive educational materials each year to youngsters, educators and concerned citizens. Educational activities are financed through contributions for Wildlife Conservation Stamps.

About the Environmental Science Center—5400 Glenwood Avenue, Minneapolis, Minnesota 55422

The Environmental Science Center, established in 1967 under Title III of the Elementary and Secondary Education Act is now the environmental education unit of the Minnesota Environmental Sciences Foundation, Inc. The Center works toward the establishment of environmental equilibrium through education—education in a fashion that will develop a conscience which guides man in making rational judgments regarding the environmental consequences of his actions. To this end the Environmental Science Center is continuing to develop and test a wide variety of instructional materials and programs for adults who work with youngsters.

Nature's Part In Art

An Environmental Investigation

BY

NATIONAL WILDLIFE FEDERATION

MINNESOTA ENVIRONMENTAL SCIENCES FOUNDATION, INC.

Design and Illustrations by
JAN BLYLER

In an age where almost everything of "quality" is man-made and machine-crafted, people sometimes have misconceptions about nature. They think that it is fragile, useless, or good only for gazing, smelling, touching, hearing. To the contrary, natural items comprise all that's necessary to fulfill man's needs—as thousands of generations have demonstrated.

We feel that it is important to make children aware of Nature as The Provider. **Nature's Part in Art** starts that process by portraying nature as the true art supply shop. The unit helps children see, feel and experience their environment, while collecting natural items for art projects. The main objective behind these activities is to give children intimate contact with their environment and to have them discover, first hand, some of its many components.

Table of Contents

Introduction 3

Plant Dyes 4

I. Dyeing Wool 4

II. Making Batiks 4

Printing 5

I. Blueprints 6

II. Tempera or Printing Ink 6

III. Pattern Printing 7

IV. Shadow Tracing 7

Displaying Natural Materials 8

I. Collage 8

II. Cross Section Scene of a Pond's Edge 8

III. Centerpiece or Decorative Structure 9

IV. Imaginative Creatures 9

V. Terrariums 10

Sand Casting 10

Structures 11

I. Grain Stalks or Straw 11

II. Mobiles 11

III. Scrap Lumber 12

Sand Painting 12

I. Preparation 12

II. Painting a Simple Design 12

III. Painting a Raised Design 12

IV. Painting a Scene 12

Soil Painting 13

I. Preparations 13

II. Painting 13

III. Preserving 13

Dried Plant Arrangements 14

I. On Plexiglas 14

II. On Celluloid 14

Stone Structures 14

Litter 15

Man's Use of Natural Items in Designs 15

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INTRODUCTION

Children learn more, faster, and more enthusiastically when they touch the real world than when they experience it only vicariously. The art activities in this unit were devised with this idea in mind. In every case an effort has been made to present a new or little known technique for displaying or using natural items as media. An effort has also been made to present art experiences that will be science experiences.

We have included several techniques for reproducing natural items by printing or casting. Unique displays are suggested for showing plant growth near a pond and making arrangements with driftwood, pebbles, and dried weed. Sand painting and soil painting suggest the use of natural items as media. An artistically arranged mini-terrarium brings life to art, and a few activities are provided just for fun. All the activities should be enjoyable.

This unit is just a beginning. We hope you will try these ideas, expand them, and enrich them to suit yourself and your class. The important thing is to get the children to appreciate nature and, hopefully, to become concerned about it.

MATERIALS

basin and/or pail
hot plate
sieve or muslin
drying rack
wool cloth or yarn
cotton cloth
paint brushes
wax
newspaper
pots and pans
an iron
blueprint paper
plexiglas
heavy cardboard or wood
clothespins
light source or overhead projector
assorted paper
tempera paints
paint rollers
printing ink
fiberboard
black crayon or charcoal
white glue and applicator
lacquer or shellac
plastic bags
rubber bands or string
assorted containers for paint
assorted containers for specimens
pins
boxes
fine sand
plaster of paris
liquid soap
paper clips
trowel
straw (grain stalks)
wire (coat hanger, etc.)
string
thread
nails
lumber scraps
baby food jars
spoons
food coloring
paper plates
soils
celluloid
scissors
large paper bags
plasticene spray
pail or heavy board
print fabric samples
wallpaper sample book
pictures or design, man-made items
assorted design and decorating books

Nature's Part In Art

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Plant Dyes

PLANT MATERIAL TO GATHER		
PLANT	**PLANT PART**	**COLOR PRODUCED**
onions	papery brown outer skin	yellow
black walnuts	nut husks	brown-black
beets	the beets	red
blueberry	the berries	dark purple
red cabbage	cabbage	blue-violet
grapes	grape	pink
birch	leaves	yellow-beige
spinach	leaves	green
elderberries	berries	red
nettles	roots and leaves	yellow
bloodroot	root	red
briar	root	violet
butternut	husks	purple
red cedar	bark and berries	khaki
mullein	leaves	yellow

Note: The activities in Part I., "Plant Dyes," and Part II., "Making Batiks," involve the use of hotplates and boiling water. We have written the unit in terms of the children doing all the activities. However, if your students are very young, you will probably want to set up a single hotplate at the front of the room and dye the material as a class project. With older children you might have several hotplates around a central area with groups of students working on different dyes. You will want to decide how best to do this, depending on the age of your students.

MATERIALS

plant material (see chart)
a large pan of water
a hotplate
a pail or basin for rinsing
a sieve or piece of muslin for draining
a branch or rack for drying
wool cloth or yarn to dye (other materials can be used but wool works best)

I. Dyeing Wool

Have the children boil a dye-producing plant part in water for 10-15 minutes. They should use about two cups of water for every cup of plant material. Have them cool the water and strain out the plant parts.

Now have the students place the wool cloth or yarn in the cooled dye and bring it slowly to a boil, stirring gently. Have them remove the cloth and drain it in a strainer when it reaches the correct color.

(Note: Pieces of cotton sheeting placed in cold dye will work for beginners. This is a much simpler and cheaper procedure but the results aren't as colorful.)

II. Making Batiks

In batiking, a hot, melted wax is applied to cloth in some type of pattern or design. The cloth is then dyed and when the dye has set, the wax is removed. The dye will not penetrate those spots where the wax has been applied, thus producing a pattern or design.

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MATERIALS

- *cloth—cotton from old sheets works well. Rip or cut it into convenient shapes and sizes. Small sizes are best at first.*
- *paint brushes*
- *wax (paraffin, old candles, beeswax)*
- *assorted pots and pans to boil dyes and melt wax*
- *newspaper*
- *sieve*
- *an iron*
- *plant parts from which to make dyes (see above list)*
- *hotplates*

Have the children boil some of the dye-producing plant parts in water for 10-15 minutes. They should use about two cups of water for every cup of plant material. Have them cool the dye and strain out the plant parts. They should do this separately for each color.

Now have the students melt paraffin, candles, beeswax, or a combination of these to get melted wax. The wax is going to be spread over parts of the cotton cloth. The amount of wax needed will have to be determined by the size of the pieces of cloth, the number of individual batiks the class will be making, and so forth. The wax should be hot enough that it will soak through a piece of cloth when applied. If the wax dries before penetrating the cloth, it will not keep the dye out of the cloth.

Caution: Paraffin and other waxes are flammable. They should be melted over water (in a double boiler). Never melt in a pan directly over fire or hot plate. Do not overheat.

Technique #1

Have the children take a white piece of cloth and a paint brush and dribble wax on the part of the cloth they wish to keep white. The wax must soak through the cloth. Then have them place the cloth in the lightest colored dye of all the colors they will use until the cloth is the desired shade. (Remind them it will be lighter when dry.) They should then remove the cloth and hang it up to dry—*out of the sunlight.* When the cloth is dry, have the students dribble hot wax on the parts whose color they want to retain. Then have them put the cloth in the second lightest color and leave it there until the unwaxed portions are the desired shade. They should then hang the cloth up to dry.

The students should repeat the procedure for as many colors as they want, going progressively from lighter to darker colors. When the coloring is completed the cloth should be ironed carefully between several sheets of newspaper to remove most of the wax. If *some* wax is left in the cloth, the colors will remain brighter. Frame or hang the artwork any way the children wish.

SUGGESTIONS:

Pictures and geometric shapes can be created by painting the wax on the cloth rather than dribbling it. Only small spaces can be waxed at a time because the wax cools quickly on the brush and stops penetrating the cloth.

Both water and sunlight may damage the dyed cloth, so have the students avoid both.

The children should be encouraged to try making other dyes from different plants which haven't been mentioned here.

Technique #2

Have the students take small portions of the piece of sheet and wrap it securely with string or thread, overlapping the string many times to keep the dye from penetrating the cloth. They should then dip the knotted portions into a dye, (making sure they use the lightest dye first). They should let the sheet dry and then retie it in other areas leaving the first areas tied. Then they should re-stain it, using a darker dye, and again allow it to dry. If they wish, they can retie and re-stain a third or fourth time. The colors will run together and blend. The background will remain the color of the original cloth.

Printing

Several days before you plan to begin the classroom activities, have the children begin collecting a few flat natural items from their surroundings—leaves, weeds, etc., would be fine. They might do this at home, walking to and from school, during recess or during a special "nature hunt."

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I. Blueprints

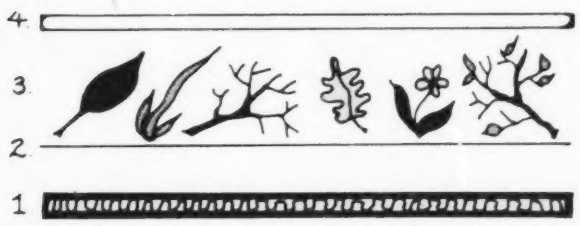
MATERIALS

- *blueprint paper (available from a drafting supply house.)*
- *heavy cardboard or wood in various sizes*
- *clothespins (clip-on type, available from hardware store.)*
- *light source*
- *leaves, weeds, grains, branches*
- *sheets of plexiglas—4 or 5 (these can be varied in size to accommodate small or large compositions, and are available from a hardware store or art supply store.)*

After the children have gathered their natural items, have them cut out pieces of blueprint paper. Each child's sheet of paper should be large enough so that all the items he has collected can be arranged on it.

Have the children cut pieces of heavy cardboard the same size as their pieces of blueprint paper. Have them put the cardboard down on their desks and then place the blueprint paper on top of the cardboard, white side down, blue side up. Then they should each arrange their natural items on top of the blueprint paper (on the blue side). On top of their arrangement, have them each lay a piece of plexiglas cut to the size of the blueprint paper. Several clip-on clothespins should be fastened around the edge of the four layers (cardboard, blueprint paper, natural items, plexiglas).

1. cardboard
2. blue print paper
3. natural items
4. plexiglas
5. clothes pins



Now have the children expose the tops of the arrangement (blue side of the paper) to the light source—either the sun or an overhead projector. The arrangement should be exposed until the visible paper has lost most of its color. Then everything should be separated and the blueprint paper should be rinsed in water to "fix" the print. The prints should be allowed to dry in a flat position. Then have the students trim the print for display.

II. Tempera or Printing Ink

MATERIALS

- *paper—12" x 18", 9" x 12"; white, manila, assorted colors*
- *tempera paints or washable printing inks*
- *paint rollers, at least 3 or four inches wide*
- *containers—paper plates, plastic toys—for use as paint bins for rollers*

On the day you plan to begin the activities, select a location in the room for each color that your students will use. These places will be the **color stations.** At each color station place one color of paint or ink, a roller, and a container to hold the paint.

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A. Applying Paint to the Paper

When the students are ready to begin printing, have them each select one natural item which they want to print and a piece of paper on which to print it. Have them place their item on the paper; then have them put some paint in the paint bins (the containers) and dip a roller into the paint.

The children should now roll the paint lightly over the item, covering all sides. They should continue this until each is satisfied with the depth of color. The item should be lifted quickly to reveal on the paper a silhouette of the item. This procedure can be repeated on the same piece of paper using different colors, different items, and different locations on the paper.

B. Applying Paint to the Natural Item

Have the children either dip their natural item in paint or roll paint onto it. They should then place this painted item on a piece of art paper and top it with a second piece of art paper. Have the children press carefully and slowly over all the parts of the object so that all the paint will be picked up. When the paper and the natural item have been separated, two prints will have been made.

The print may be left as it is, or variations might be added by using several natural items, different colors, and different arrangements for pleasing compositions.

III. Pattern Printing

MATERIALS

paper
ink or paint
brush, roller, or pan for dipping object into paint
natural item with an interesting rough texture that will print; preferably the item should be one that can be rolled over a piece of paper. Some good possibilities are: top portion of cattail, cones such as those from white spruce. Also might use wooden plank which is fairly smooth on one side.

Have the students place paint or ink on the natural item either by dipping it in paint or by brushing or rolling paint onto it. Then have them place their items on sheets of paper. If the surface of the item is flat like a wooden plank, the children can press the object down onto the paper to get an imprint. If the item has a cylindrical shape like a cattail top, the object itself can be rolled across the paper to obtain a repeating pattern. If desired, the children could repaint the same item or another one and print again. For example, they might first want to print an all-over wood grain pattern as a base. On top of this they might want to print some scales from a pine cone or spruce cone in another color.

IV. Shadow Tracing

MATERIALS

paper—large roll and smaller sheets according to the size of the item to be traced
light source
leafless twig or small branch
stones
black crayon or charcoal

Select a sunny, windless day; break the class into teams of two children each, and have each team find a leafless twig or small branch. Then give each team some paper. Have one child from each team use stones to anchor the paper on a smooth surface (for instance, a sidewalk). The other child should hold his team's branch in a position that will form a shadow on the paper.

The first child can trace the shadow with black crayon or charcoal.

Then have the teams move the branch to form different shadows, and trace these in turn. This will enable them to record a variety of patterns. The patterns might be superimposed or separated as the children wish. For further related activities, you may want to check **Shadows**, another unit in this series.

Displaying Natural Materials

I. Collage

MATERIALS

fiberboard (one large sheet or several small pieces)
applicator—large brush, paste spreader (piece of wood)
paste—½ white glue and ½ lacquer
natural materials selected for large display—rocks, branches, leaves, seeds, grasses, etc.

This next activity can be done as a class project using a large piece of fiberboard or as an individual or team project using smaller boards.

The aim is for the children to gather some natural objects which they find either around their home or on their way to school, or during an organized class field trip. They then glue these items to one or several fiberboards to make collages.

Ideally, it would be best to let the children collect just what they want without suggesting specific things to them. You may, however, have to give them some guidelines, especially if the collecting is done as a class activity. For example, if an individual child removes a live leaf from a tree in his own yard, there should be no problem. But if all members of the class were to go into a park area and each take a leaf from one small tree, this might harm the plant. If you do use a park, you will probably want to restrict their collecting to fallen leaves, dead branches that have dropped to the ground, small stones, etc. Also you will want to get permission from the park superintendent before collecting in the park.

Prior to outlining the collecting activities, display the large fiberboard or one of the small ones for the members of the class so that they can get an idea of size and dimensions. Explain to the students that they will all be collecting natural items, either on a field trip or during the next several days.

After the children have made their collections, allow them as much time as necessary to plan their arrangements, positioning their items without using glue. They could do this on tables, in areas the approximate size of the fiberboard they will use.

When this pre-arranging has been done, have the children cover the board or boards completely with the paste (½ white glue and ½ lacquer), using a brush or paste spreader. This will dry slowly so there is no need to have them hurry. Then have them arrange the materials on the board, push the materials into the paste, and hold the items in place until they are firm. Allow this to dry for 24 hours before hanging it up.

II. Cross section Scene of a Pond's Edge

In this activity, the students will reconstruct a cross section of a pond edge by gathering natural materials at various intervals leading away from the pond, on a line roughly perpendicular to the pond's edge.

MATERIALS

fiberboard (4' x 8', available from a lumber yard)
paste (½ white glue, ½ lacquer)
applicator—brush, paste spreader or piece of wood
natural materials

Take the class to a pond and have the students observe the vegetation in the following areas:

1) in the water
2) at the edge, growing in the water
3) at the edge, growing on land
4) ½ foot from water
5) 1 foot from water
6) 2 feet from water
7) 3 feet from water
8) 4 feet from water, etc.

Have the class choose an interesting spot which extends back several feet from the pond's edge. Then have the class collect vegetation samples from all eight areas listed above as well as at other distances you might choose. The collecting should be done along a single line which is approximately perpendicular to the pond's edge. Have each collector label his items according to their distance from the water's edge. Encourage the class to bring back soil, roots, duckweed from the water, etc.

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When back in the classroom, place the fiberboard on a table or on the floor. Explain to the students that they are going to create on the board a representation of the cross section of one edge of the pond and the adjacent land area. It will depend on your orientation, but looking at the board along the eight foot edge, if the area at the extreme left represents the water, then successive areas to the right will represent the point where the water meets the land, then possibly some sand or gravel, followed perhaps by short grass, taller grass, small shoots of trees, and so forth.

Begin making the model by having the children use a large brush or paste spreader to cover the board completely with paste (½ white glue and ½ lacquer). This will dry slowly so there is no need for the children to hurry.

Have the children begin building up the cross section by starting with the water area. They should place the duckweed and any other water plants on the board in the appropriate section, pushing the items into the paste and holding them in place until they are firm. Then have them spread soil (including sand, pebbles, and other components of the soil) to indicate the upward slope of the pond bottom and the shore area. On their model, they should continue inland from the pond's edge, placing soil, grasses, plants, small tree shoots, and so forth on the board in the sequence in which these were located along the actual pond. The children may have to put some additional paste on top of the soil at spots where they want to place large plant stalks. Also, they may need to work out a way to support tall reeds and other grasses until the paste and soil is strong enough to hold them upright.

They should continue to place the plants from each area onto the board until all the plants collected have been situated, or until all the available space has been used.

Allow the cross section model 24 hours to dry.

III. Centerpiece or Decorative Structure

MATERIALS

white glue
natural items: twigs, roots, driftwood, acorns, rocks, grains and grasses, pine cones, berries

The collecting of the natural items on the materials list will have to be done over a period of time, and will probably work best if done independently by the students. This will insure the selection of a variety of items.

Have the children examine all the materials that they've collected. They might want to make one large centerpiece as a class, or several smaller ones. They should consider possible combinations of driftwood, rock, grain, berry, etc., to form a pleasing display. When they have had enough time to discuss arrangement, have them glue the items together with white glue, holding them in place until they are set. Suggest to the students that they shouldn't include too many natural items. The display should be kept simple.

IV. Imaginative Creatures

MATERIALS

white glue
natural material in unusual or interesting forms: roots, twigs, driftwood, rocks

The collecting will probably have to be done independently by students, over a period of time, in order to get particularly unusual forms. When each child has collected the objects he wishes to use, have him examine them and determine how he can put the pieces together to form a real or imaginary creature.

Driftwood or rock could serve as a base for the creature, while roots and gnarled branches would make interesting bodies. The base and the figure itself should be glued together.

The strangeness can be increased by adding an "acorn eye," a "berry nose," "mossy hair," etc. These extras should be glued on. Then the creature should be allowed to dry.

When all the creatures have dried, have each child write a story or poem about his own creation.

V. Terrariums

MATERIALS

- *containers—clear plastic box; or plastic or glass tumbler; or glass jar—(one of any kind per student)*
- *plastic wrap or plastic bags*
- *rubber bands or string*
- *natural items: soil, living plants, dried plants, rotting bark or wood, acorns*

Carry all the materials for holding and covering the terrariums out to the area where the students will be collecting the natural items. It will be better to have each student create his own small terrarium than to have the class as a whole make two or three larger ones. That way each child will become actively involved in canvassing the environment. However, you might want to have one large classroom terrarium *along with* the small ones.

Make sure that each child has his own container. Ask each child to put in his jar the following:

1. SOIL
2. SMALL PLANTS
3. DRIED PLANTS
4. ROTTING WOOD
5. ACORN OR GALL

Have each student cover a container with one layer of a lightweight plastic wrap. Make sure they put a pencil hole in the plastic so that air and moisture can be exchanged. Once back in the classroom, have the children add a few drops of water to their containers. Droplets formed on the inside walls or plastic covering of the container will signal that there is enough water in the terrarium.

Sand Casting

MATERIALS

- *boxes—wooden or cardboard*
- *sand—as fine as is available*
- *plaster of paris*
- *shellac*
- *liquid soap*
- *an item to print: an animal foot, an animal print in hard soil*
- *paper clips*
- *trowel*

Have students search for paw prints outside on the ground. You may want them to work individually or in groups, whichever seems best. Areas that have previously been moist and then have become dry and hard would be good places to look. If the ground is hard enough and the children are very careful, they may be able to cut around a print and underneath it and then, with great care, lift it and place it in a small box. Either at the site or back in the classroom, have the students shellac the prints. Allow the shellac to dry.

After the shellac has dried, have the students fill in their boxes around the print with sand so that the sand is level with the edge of the soil containing the print. Then have them coat their prints with liquid soap.

Next have the students or groups mix plaster of paris (add salt for quick drying) and have them pour the plaster of paris about one inch thick over the

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prints. A small paper clip should be partially imbedded in the plaster of paris so that the molded prints can be removed easily when dry. Once the plaster has dried, have the children remove the prints and brush them gently with a small, dry paint brush to remove any loose particles. They will find that the casts are positive prints which can be coated with liquid soap and used to create other negative or indented casts.

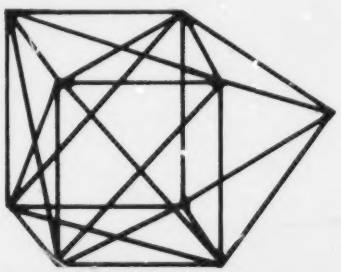
Structures

I. Grain Stalks or Straw

MATERIALS

straws—several large ones per student
pins
base materials—wood, paper, and tray
glue

Have the children make an interesting structure out of natural straw they have gathered in a field. They can cut the straw in equal or different lengths, several inches long. Pieces of straw can then be glued together to make some basic geometric shapes such as a triangle or square. This can be done on waxed paper, using pins to hold the straw in place until the glue has dried. These individual sections can then be glued together to make three dimensional structures. Each structure can be placed on a wooden or paper base if a student wishes. After the structures are complete, some students may want to test the strength of theirs by cutting a straw here and there to see how many cuts it can withstand before collapsing.



II. Mobiles

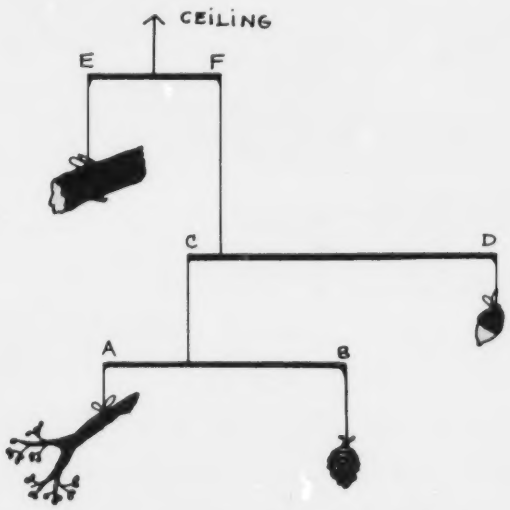
MATERIALS

wire that is fairly rigid—(about the tension of a paper clip)—or coat-hanger wire
string
thread
natural materials: branches, twigs, driftwood, leaves, grains, weeds, acorns, pine cones, bark

The mobiles could be made by individuals or by small groups of two or three students each.

Have the students lay out the materials on a table or on the floor. Have them begin to place the materials in an order they feel would be appropriate for making a mobile which will hang from the ceiling. They should decide which items would be on the top, and which items they want to have hang the lowest.

The best way to make the mobile is to start with the two bottom objects. As illustrated in the drawing which follows, the first object (a branch in this case) should be attached to one end of the wire and the pine cone to the other. Sometimes it is difficult to tie the string tightly to the wire, so a little rubber cement put on the string and the wire will help keep the knots secure. After tying the two objects on either end, another piece of string should be tied to the middle of the wire and slid back and forth until the system (AB) balances. Next, have the children take another piece of wire (CD) and on one end (D) attach another object (perhaps an acorn). Then they should tie the system AB on to the wire CD. Have the children find the balance point of CD and attach a string there. They should continue using the same procedure with EF. The children can attach as many layers or systems as they want but for young beginners three is a good number. A string attached at the balance point of the top system can then be tied to the ceiling. By starting with the bottom and balancing each system as they go upward, the children will have the entire mobile balanced by the time it is completed.



One of the interesting things the children will probably discover for themselves in constructing the mobile is that a heavy object placed a short distance from the string which supports the wire can be balanced by a much lighter object placed at a greater distance from the supporting string. Thus, as in the

drawing, a relatively heavy branch (A) can be balanced within limits by a light pine cone if the supporting string is placed at the correct spot.

The preceding explanation has gone over just one way a simple mobile could be constructed. The children might want to experiment with other more involved arrangements of their own. For example, they may decide to balance the acorn at point D with two weights on the other side of the balance point. One of those weights could be the system AB and the other weight could be another single object.

III. Scrap Lumber

MATERIALS

scrap pieces from a local lumberyard
glue
nails

Have someone from your class contact a local lumberyard for scrap materials (small, cut pieces of hardwood will probably be among their scrap items.) You might want to make a class trip out of picking up these scrap items, and incorporate a tour of the sawmill or lumberyard as a "fringe benefit" of the activity.

When back in the classroom, have the children examine the pieces and the various shapes of the scraps. Have them select pieces that will complement or fit with each other when creating an artistic structure.

The wood should be cleaned and then all the pieces should be glued or nailed together. Shellac or paint can be added as a finishing touch.

Sand Painting

MATERIALS

fine sand
baby food jars
spoons
food coloring
white glue
brushes
container for glue mixture
paper plates
paper—soft colors, white

I. Preparation

A. Coloring the Sand

Have the children fill baby food jars about halfway with sand. Then have them put in several drops of food coloring and stir. They should check the color to see if it is the shade they want, adding more color if it is desired. Then they should shake the colored sand out onto a tray or a piece of paper and allow it to dry overnight.

B. Preparing the Glue

Have the children fill several jars or glasses about half way with white glue. The jars should be filled the rest of the way with water and then stirred. Some glue should be kept in the original container at its original strength.

II. Painting a Simple Design

On sheets of paper have the children plan their designs and the colors they will use in the different areas. Then, on their paper, have each child stroke on the glue solution with a paint brush in a pattern where he wants one color. Then the sand of the chosen color should be sprinkled on the glue and the excess sand shaken off into a tray or paper plate. The glue should be allowed to dry.

Next, have the children brush the glue onto the paper in the desired shape for another color. Again, the sand should be sprinkled on top of the glue, and the excess shaken off. The children can continue this activity until their designs are finished.

III. Painting a Raised Design

Again, on paper, have the children plan their designs and the colors they will use. Then, have them use the glue bottle (undiluted) to squeeze a thick line of glue onto their paper in the pattern where they wish to have one color. Next, they should sprinkle on the sand of the chosen color and shake off the excess sand. The children should then squeeze another line where they want another color, sprinkle on the sand, and shake off the excess. Have the children continue until the design is complete in all colors.

IV. Painting a Scene

Have the children draw a scene in pencil on a piece of paper and paint the glue solution over the

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entire picture. They should then carefully sprinkle colored sand in the areas desired for background (i.e., blue for sky, green for grass, etc.). It will probably be best if they cover the entire surface initially. After the first layer of glue has dried, the children should then add on as many layers of color as desired by brushing the glue solution directly onto the sand wherever the additional color is wanted. It is best to let one layer dry before a second is applied.

When the picture is completed, it should be allowed to dry thoroughly. For the foreground items, glue should be squeezed directly from the tube and sand should be sprinkled on in several layers. The excess sand should be shaken off gently.

Soil Painting

MATERIALS

soils and sands of as many different natural colors as possible
plastic sandwich bags to hold the soil
white glue
container for glue mixture
brushes—2 small sizes, say, ½" and 1"
plasticene spray
wood or cardboard (Consider the weight of the piece of wood since you may wish to frame and hang the final results. Also consider the wood grain because if it is interesting you may want to incorporate it into the scene.)

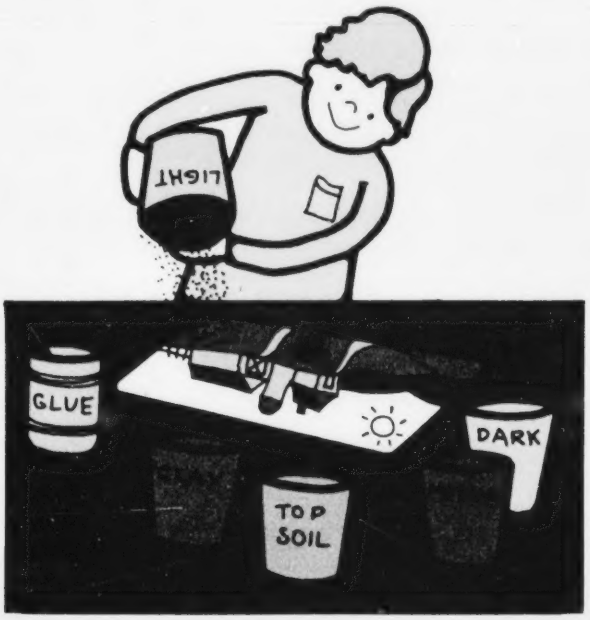
I. Preparation

Have the children gather soil from their yards, from beaches, from river and creek banks, on road cuts, etc. They should look for sands, garden soil, peat, clay, crumbled rock, etc.

To prepare the glue, have the children fill jars or glasses about half way with white glue. Then have them add enough water to fill the container. Some glue should be kept in the original container at full strength.

II. Painting

Give each child a piece of cardboard or wood. On these pieces of material, have them each sketch a scene, a design, or a picture. Then have each child use a paint brush to stroke on the glue solution where he wants to adhere one type of soil. When this is completed, the soil should be sprinkled onto the glue, and left on until the glue is dry. Then glue should be brushed onto another area of the picture. If you want sharp color contrasts it is best to let the glue dry in an area before putting glue and dirt of another color in an adjacent area. Have the children continue to apply glue and soil until the scene is complete. When the glue has all had a chance to dry thoroughly, shake off any excess soil.



SUGGESTIONS:

- **For blending colors:** have the children work with adjacent areas of their picture while the glue is still wet. They should work the two soil colors together.
- **For sharp color distinctions**: each area should be allowed to dry before proceeding to the next soil type and adjacent area.
- **For sharp and narrow lines:** the glue should be applied in full strength, directly from the bottle. The soil should be sprinkled on and the excess should be shaken off immediately.
- **For any raised heavy line:** the glue should again be applied directly in full strength, with the excess shaken off after drying.
- **For a heavy raised object:** the soil should be mixed with plaster of paris and applied immediately. (Have the children mix a small amount of plaster with a great deal of soil because it dries a lighter color than when it is applied.

III. Preserving

When the soil and glue have dried completely, have the children stand the pictures on their edges so that loose particles will fall off.

They should then repair any areas that need it. The pictures will be easier to keep free of dust if they are sprayed with plastic when finished. After the pictures are completed, the children can frame them if they wish.

Dried Plant Arrangements

I. On Plexiglas

MATERIALS

white glue	*paint brushes*
small containers	*plexiglas*
dried plant matter	

Give each child a small piece of plexiglas—a dealer might have some irregular scrap pieces which will work. In a small container, have each child mix one part glue with four parts water.

The glue mixture should then be painted on one side of the piece of plexiglas. While the glue is wet, have the children place some dried plant material (leaves, grass, seeds, etc.) in the glue. Have the children set the glued arrangement aside to dry. When it has dried, have the children add another coat of glue, covering both the plexiglas and the dried plant materials.

After the second coat of glue has dried, some of the children might want to put tape around the edges of their plexiglas to serve as a frame.

Large pieces may be used as pictures; small arrangements may be used as pendants against a window to create a stained glass appearance.

II. On Celluloid

MATERIALS

dried plant parts (use thin, flat parts such as leaves)	*juice cans, baby food jars or other small containers*
blank sheets of celluloid	*scissors*
paint brushes	*white glue*
	water

Have the children arrange dried plant parts in a pattern that they want to keep. Give each child two pieces of celluloid or one large piece to cut in half.

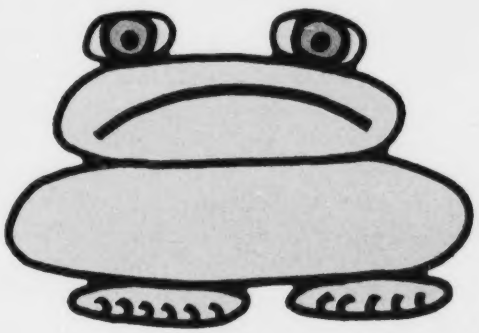
Have each child make a mixture of one part glue to four parts water in a small container. The glue should then be painted on one side of each child's two celluloid sheets. Before the glue dries, have each child transfer his arrangement to one of the wet glue-covered surfaces and then cover the arrangement with the second piece of celluloid. Once these "sandwiches" have been made, have the children put heavy objects on top of them to press them down.

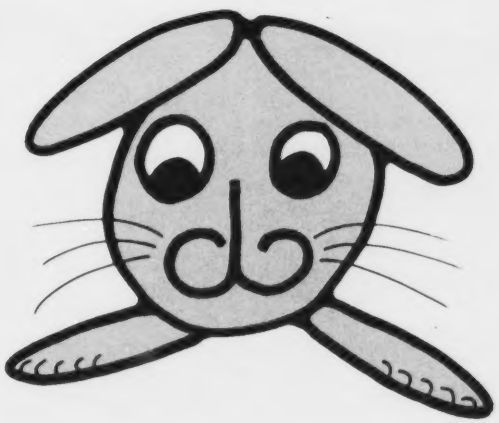
Depending on the size, these may be used as placemats, pictures, bookmarks, etc.

Stone Structures

Children enjoy collecting small stones. The collections can be used to make sculptures by having the children glue the stones together. These designs can be abstract or realistic. The children might construct imaginative animals, people, or other figures. Paint is useful for adding eyes, mouths, and similar details.

White glue works well for sticking the stones together. Other adhesives will also work. White glue, thinned with water and brushed over the finished structure, will give it a wet or glossy look.





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Litter

(For fun and clean up)

MATERIALS

items picked up around the school grounds that do not belong there—papers, wood, metal, cans, etc.
glue, tacks, nails
a base for the structure (pail of sand or heavy board)
large paper bags

Plan to have the children create funny structures from the items found on the school grounds. Take a class trip around the school ground, cleaning up all such items. When back in the classroom, have the children sort the items, discarding those that cannot be used on the structure.

Have the children plan the structure to go on the base, (a pail of sand or heavy board) and begin to build it, from the base upward. Put the heavy items on the bottom and the light ones on top.

Man's Use of Natural Items in Design

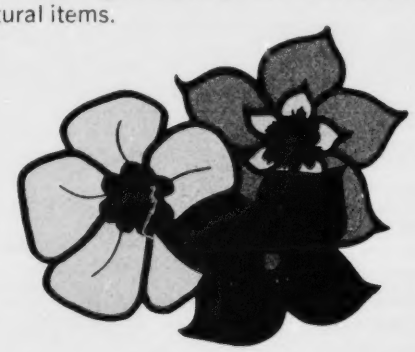
MATERIALS

print fabric samples
wallpaper book
pictures of designs on any man-made items
books—furniture decoration, rug design, embroidery design, quilt design, silver, china and glassware design and decoration; or designed items themselves.

Initiate the activities by bringing in a wallpaper design book. Have the class examine the patterns. See if they can note the many ways that the designer has used familiar natural items in his design. Can they see real or abstract leaves? Animals? Trees? Anything else?

Then have each child design his own wallpaper using images of things from nature.

Ask all the children to bring in a piece of fabric or clothing with a print displaying items of nature. Have each child design a fabric print himself, using images of natural items.



Many man made objects incorporate patterns from nature in their designs. Ask the children to look at silverware and dishes at home and notice whether the patterns are borrowed from nature. In class, the children can try designing patterns for use on glasses, dishes, silverware, etc.

Now have the children design a silverware, plate, or glassware pattern.

In all of your activities involving natural design, you will find it helpful to have a variety of resource books available for the children to use as reference.

You may want the children to collect in a notebook samples of nature used in designs as well as the designs that they themselves have devised. You might point out to the children that almost all pleasing designs are representations or abstractions of natural objects, or of configurations which are found in nature.

THE ENVIRONMENTAL UNITS

Below is a list of the first titles in the Environmental Discovery Series. The ones with order numbers next to them are available as of January, 1972. The others are in preparation and will be available in the coming weeks. Also, ten additional units will be announced soon.

Next to the titles, we have suggested the grades for which each is most appropriate. We emphasize that these are suggested grade levels. The teacher is encouraged to adapt the activities to a wide range of grade levels, and subject areas depending upon the interests and abilities of the students.

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